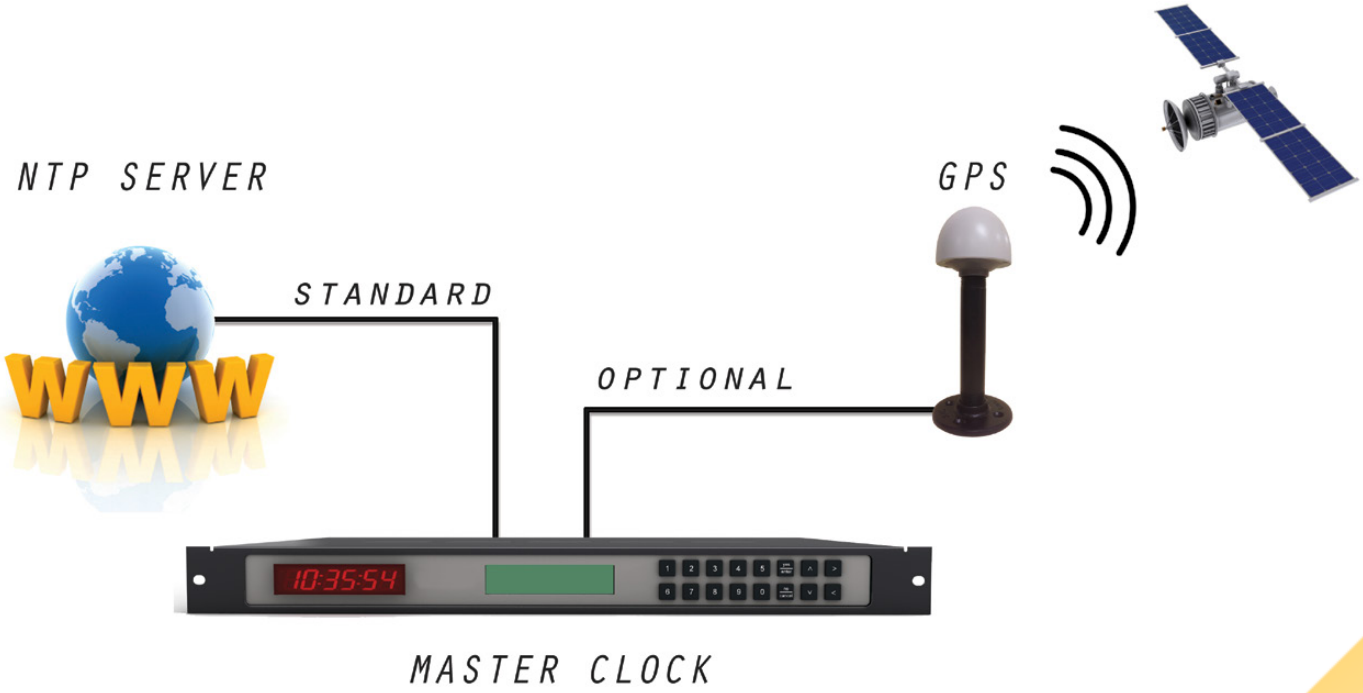
Simplex TIME SOLUTIONS

Master Clocks

SMA MASTER CLOCKS

We are proud to introduce its SMA Series Master Clock. The standard models come loaded with many helpful features including a user friendly built-in web interface for master clock settings and monitoring, as well as many optional features to choose from, allowing system flexibility all wrapped in an elegant and stylish housing.

The Master Clock is the center of a synchronized clock system. The master clock's primary function is to receive accurate time and distribute that time to all of the secondary clocks and other devices throughout a facility. The master clock is programmed to frequently send out a time signal in order to prevent the clocks from drifting. This will allow all of the secondary clocks in the facility to always display the same time on every clock within a system.



How Does the Master Clock Receive Time?

The master clock can receive the accurate time mainly from two sources:

- **NTP Server** - A standard feature in each and every master clock model
- **GPS Receiver** – An optional feature

The master clock can also receive the time from:

- Once-a-day contact closure from a third party device
- May interface with existing clock systems (58 minute or, 59 minute protocol, National Time / Rauland or Dukane protocol)

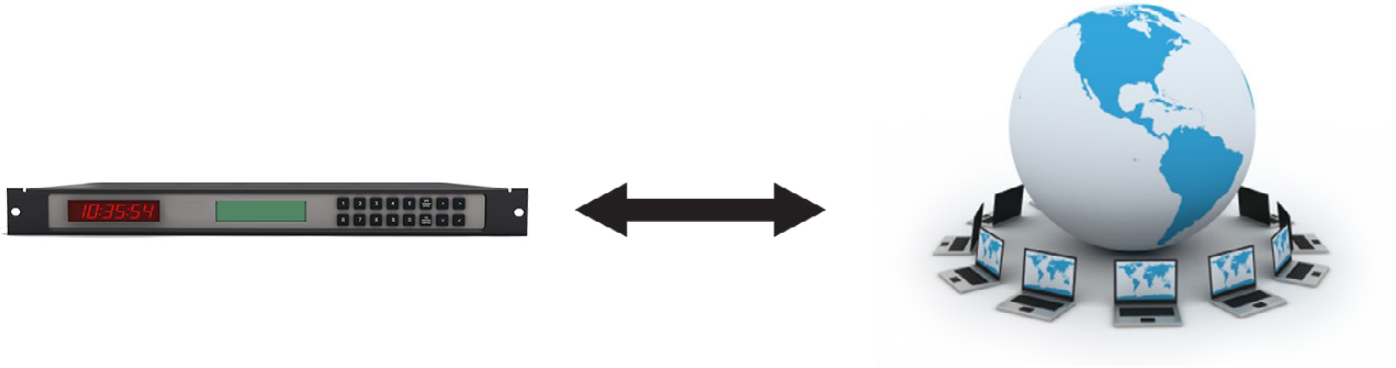
Additionally, the master clock has its own internal real-time (quartz) clock. In the event that communication with the accurate time source has been lost, the system will still be synchronized based on the real-time (quartz) clock, until communication with the accurate time source has been restored.

RECEIVING ACCURATE TIME FROM AN NTP SERVER

All Master Clocks receive accurate time from NTP servers as a standard feature. A master clock may receive its time either from an external NTP server (third party NTP server) or via an in-house NTP server (if there is one in the facility).

Receiving Accurate Time from Third Party NTP Servers:

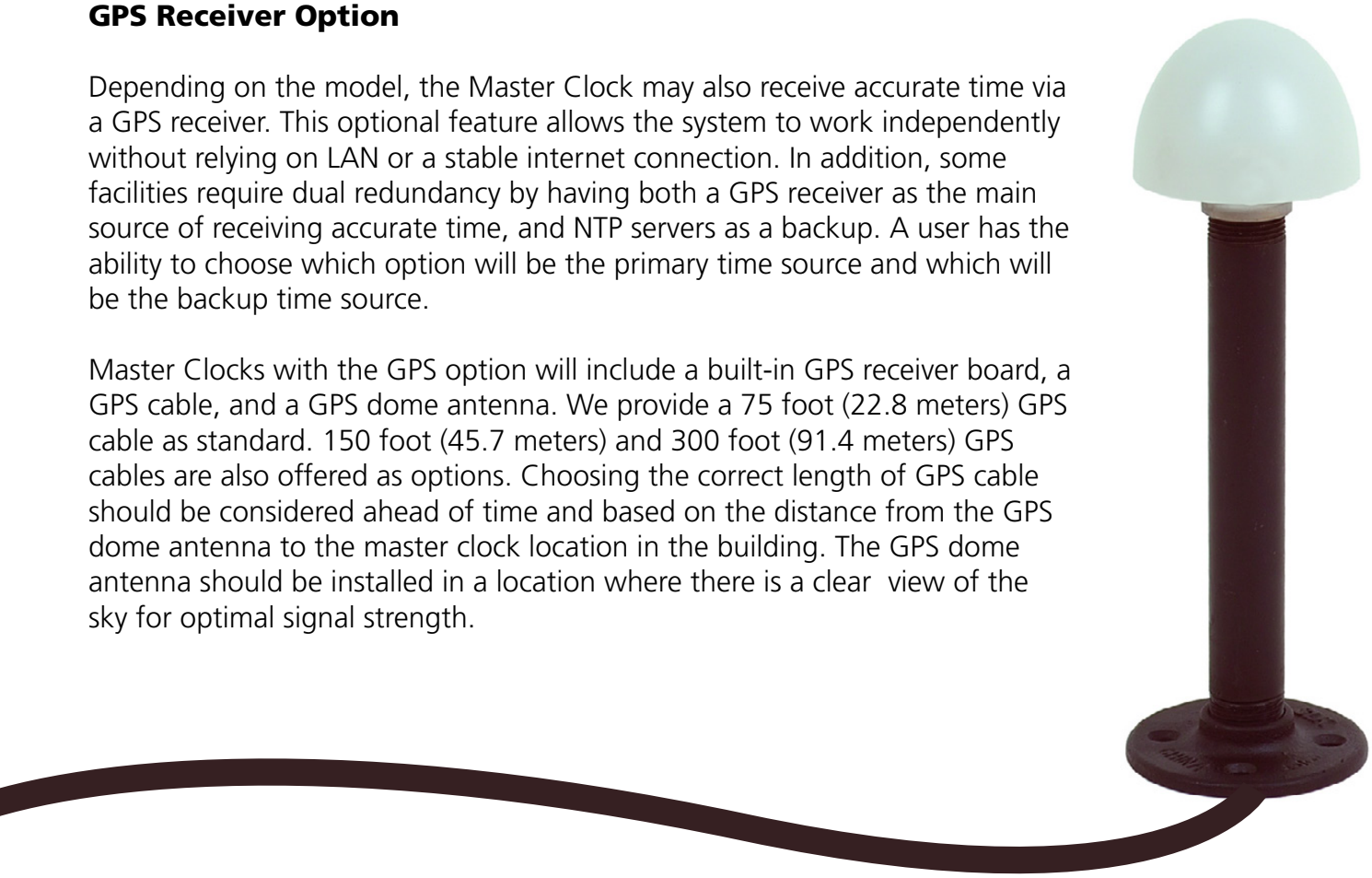
Sources of NTP time include government facilities, colleges and universities, and various corporations. Such institutes allow a free connection to their NTP server via the Internet as a source of accurate time. Our master clocks are designed to store up to 10 NTP server IP addresses for redundancy. This means that if communication with the first NTP server has been lost, the master clock will automatically attempt to receive accurate time from the next NTP server in the list. This unique feature provides reliability and redundancy to the system. We already provide the master clock with 10 NTP server IP address inputs to get accurate time from, but at any time you are able to change all 10 default NTP server IP addresses to ones that you prefer.



Receiving Time from an In-House NTP Server:

Some facilities already have their own in-house NTP server. In this case, the in-house NTP server IP address should be set in the master clock so it will refer to this in-house NTP Server and receive NTP time via LAN connection. In addition, there are still 9 other NTP server IP addresses that can be stored for backup and redundancy.

GPS Receiver Option



Depending on the model, the Master Clock may also receive accurate time via a GPS receiver. This optional feature allows the system to work independently without relying on LAN or a stable internet connection. In addition, some facilities require dual redundancy by having both a GPS receiver as the main source of receiving accurate time, and NTP servers as a backup. A user has the ability to choose which option will be the primary time source and which will be the backup time source.

Master Clocks with the GPS option will include a built-in GPS receiver board, a GPS cable, and a GPS dome antenna. We provide a 75 foot (22.8 meters) GPS cable as standard. 150 foot (45.7 meters) and 300 foot (91.4 meters) GPS cables are also offered as options. Choosing the correct length of GPS cable should be considered ahead of time and based on the distance from the GPS dome antenna to the master clock location in the building. The GPS dome antenna should be installed in a location where there is a clear view of the sky for optimal signal strength.

Internal Time Source

Master Clocks have a built-in real-time (quartz) clock that can be used as a time source. This internal clock is capable of providing the time to the secondary clocks within the system. In this scenario, even though the master clock is not communicating with an NTP server or GPS, all the secondary clocks in the system will still be synchronized according to the real-time (quartz) clock in the master clock.

In the event that there is a communication failure between the master clock and the accurate time source is lost (either NTP or GPS), the real-time (quartz) clock will serve as a backup and become the primary time source for the secondary clocks until communication with other time source inputs has been restored.

MASTER CLOCK SETUP

It is very important to set up the master clock per the user manual provided by us in order to properly program the accurate time source, location, Daylight Saving Time (if applicable), and any other relevant settings.

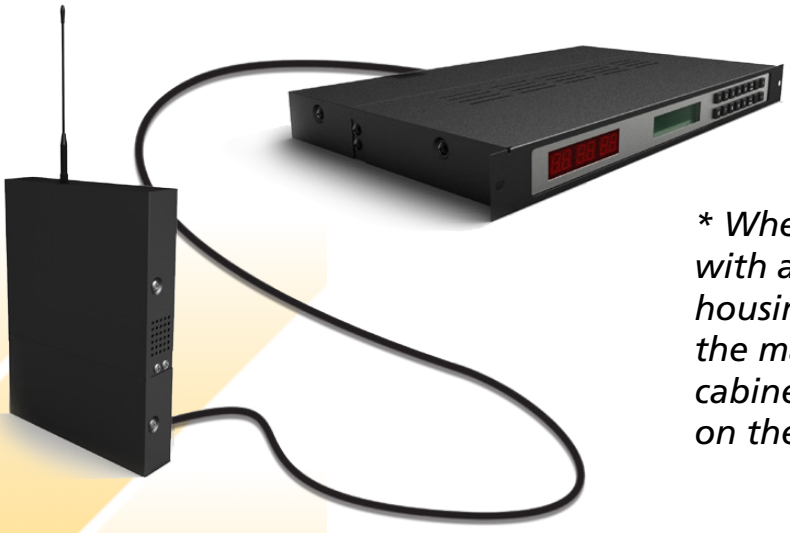
Master Clocks will indicate a communication failure with the accurate time source by a blinking LED on the front panel of the master clock. Master Clock can also be programmed to send an e-mail alert to the system administration in the event of a communication failure. It is very important to refer to the master clock user manual in order to make sure that the master clock is set up properly.

Master Clock Optional Features:

We offer many options for its master clock so that it can fit a wide variety of applications. Please review the options that are available in order to choose the master clock model that will best fit your application needs.

Master Clock Housing:

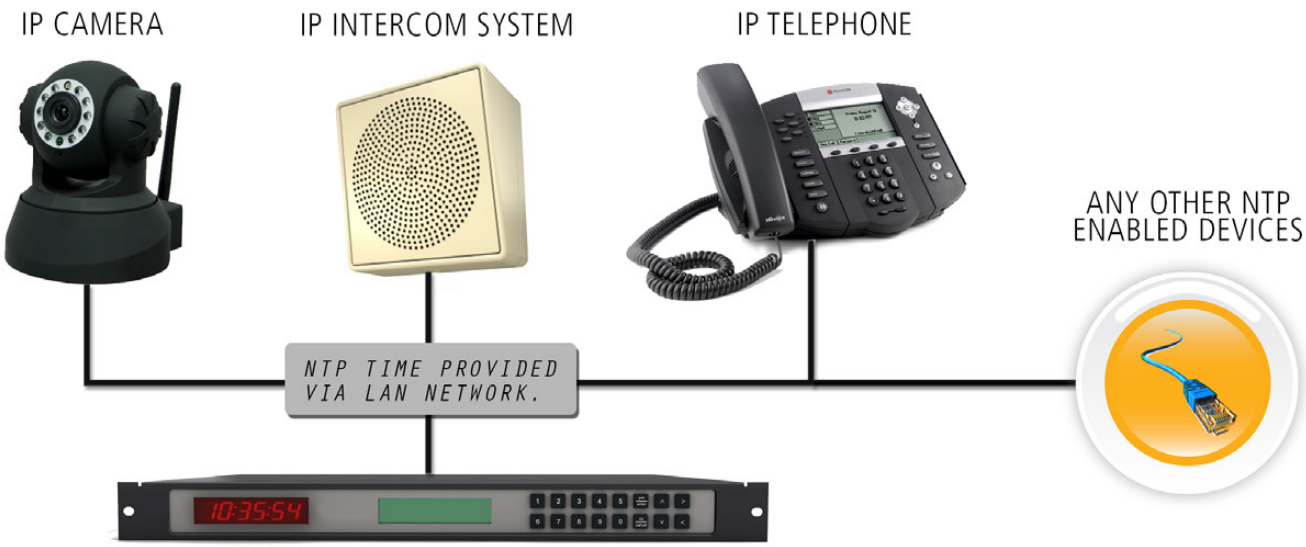
** The first option is whether the master clock should be a wall mount or rack mount. All master clock models are offered as either a wall or rack mount.**



** When choosing a rack mount master clock with a transmitter, we provide an additional housing for the transmitter. This allows the master clock to be placed in a network cabinet, while the transmitter is mounted on the wall for optimal signal strength. **

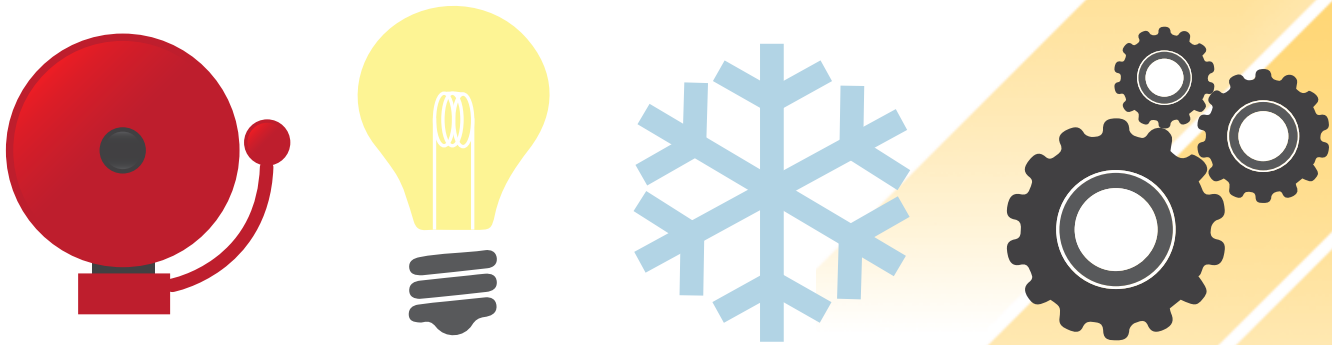
NTP Master Clock Upgrade:

Standard master clocks will only communicate the time signal to the secondary clocks in the system. Some facilities require an in-house NTP Server in order to provide NTP time to other IP devices such as: security cameras, IP phones, intercom systems, time and attendance systems, or any other IP system that can receive NTP time. Depending on the model, Master Clocks can also act as an NTP server and in this case, they will communicate the accurate time to other IP devices in addition to the secondary clocks in the system, so all devices will be operating with the same exact time. This saves money eliminating the need to buy a separate NTP server for the facility.



Programmable Relays:

Another great optional feature for Master Clocks is the ability to control other devices at pre-determined times. The master clock has relays, also known as Zones, that can be activated by the master clock scheduling feature. Scheduling is done easily via the built-in web interface, or by using the front panel keypad. This will allow you to connect any system containing a relay closure input to the master clock and turn it off and on at pre-determined times. This is useful for school bells, air conditioning, lights, and more. Master clocks are offered with no relays, 4 relays, and 8 relays.

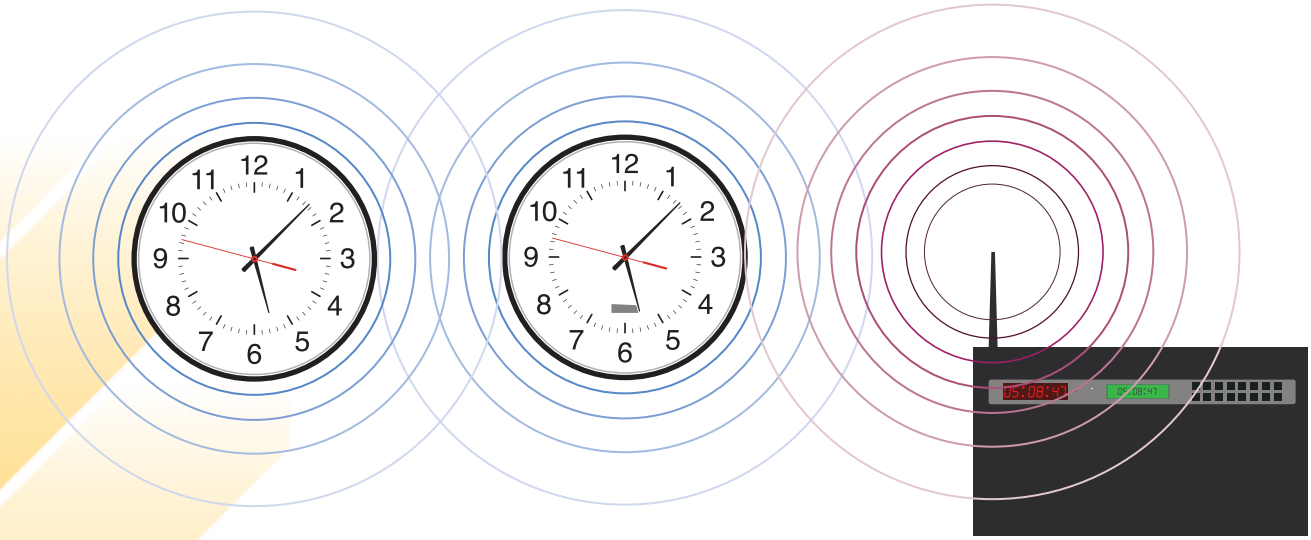


Countdown Commands:

Another optional feature that can be added to master clocks is countdown functionality. This feature gives the user the ability to schedule a countdown at pre-determined times. The master clock will send a countdown command to all connected digital clocks. This feature is mostly used for breaks in between classes at schools or between shifts in the work place. Please do not confuse this **prescheduled** master clock countdown command with the **real-time** elapsed timer, which is a clock function. When using an Elapsed Timer Control Panel, it is hard wired to one specific digital clock commanding it to count up or down as needed. When ordering the countdown command feature, at least 4 zone relays are also needed. In addition, please note that the master clock countdown feature is not applicable when using IP clocks or a sync-wired system. A real-time countdown feature for the IP system is available with the IP Monitoring Software.

Relaying Time to Secondary Clocks

One of the functions of a master clock is to relay accurate time to the secondary clocks in the system. A master clock can relay time to the secondary clocks in the system either via wires or in a wireless manner. We offer different types of clock systems, some of which are wired and some are wireless. While all of our master clocks can relay time to the secondary clocks in a wired manner, a master clock with a wireless transmitter is needed for wireless clocks. All master clock models are offered with or without transmitter. Master clocks with a transmitter will support both wired and wireless clocks, while a master clock without the transmitter will only support wired clocks.



SMA SERIES MASTER CLOCK

The following pages will provide you with information about the different master clock models offered. Each model includes certain standard features as well as optional features to select from. Please review the information that is provided in order to choose the best master clock model for your project needs.

SMA 2000 Series Standard Features

- Available in rack or wall mount housing
- LED display for a clear, accurate read out
- Two buttons for programming
- Intuitive built-in web interface that allows the system administrator to configure all the settings of the SMA Series Master Clock in a simple and easy way from the convenience of any computer on the same network
- RJ45 input for web interface and synchronization to any (S)NTP/NTP server
- Ability to store up to 10 different NTP server IP addresses or domain names for continuous accurate time and redundancy
- Automatically switch from one accurate time source to another in case of a communication failure
- Blinking LED on master clock front panel as a visual indicator to alert a communication failure with the NTP server or GPS time source
- The master clock can be programmed to send an email alert when communication with the accurate time source has failed
- The master clock can be programmed to send an email alert when the master clock has been rebooted
- The master clock can be programmed to send an email alert when the fire alarm in the facility has been activated, provided the fire alarm is connected to the master clock
- Control wired clock systems or wired and wireless clock systems simultaneously, if equipped with a transmitter
- 12 or 24 hour display
- Automatic fully customizable Daylight Saving Time updates, if applicable
- Selectable UTC/GMT offset
- Bias seconds option - offsetting the master clock to adjust the time plus or minus a few seconds or minutes to fit your application while it is still receiving accurate time input
- DHCP Capable
- Two relays for simultaneous correction of two synchronized wired systems:
  - For example: 58 minute or, 59 minute protocol, National Time / Rauland or Dukane protocol
- Proprietary RS485 input and output for time synchronization
- Can command digital clocks to display “Fire” when the alarm system interfaces with the master clock (not applicable when using a sync-wired system or an IP system)
- Microprocessor based
- Ten year battery backup for keeping time and master clock settings

SMA 2000 Series Optional Features

- GPS input for accurate time synchronization
- Transmitter for the Wireless System

SMA 3000 Series Standard Features

The SMA 3000 Series Master Clock includes all the standard features listed with the SMA 2000 Series, as well as the following:

- LED and a backlit LCD display for a clear, accurate read out
- 2 x 8 rubber button keyboard for easy programming
- Can command digital clocks to display "Bell" at user defined times. In this case the master clock must have at least four relays (not applicable when using a sync-wired system or an IP system)

SMA 3000 Series Optional Features

- Four or eight configurable auxiliary relays which control other systems by closing a relay at predetermined times.
  - 255 schedule (group of events) and 800 event capabilities (such as triggering bells)
  - Two programmable closure durations per relay
- Pre-scheduled countdown feature – The master clock will send a countdown command to all digital clocks at a predetermined time. When choosing this option, at least four zone relays are required.
- GPS time signal input for accurate time synchronization
- Transmitter for the Wireless System

SMA 5000 and SMA 6000 Series Features

The SMA 5000 and the SMA 6000 Series Master Clocks are specifically designated for the TalkBack Technology™ Wireless System and includes a TalkBack transmitter and receiver built in to the master clock. Each TalkBack clock in the system must be paired wirelessly to the TalkBack master clock. The user must then name and label each individual clock and ensure that it goes to the designated location. The TalkBack clocks are designed to perform a self-diagnosis of various functions and transmit a status report back to the TalkBack Master Clock.

The SMA 5000 Series Master Clock includes all of the standard features listed with the SMA 2000 Series, as well as the following:

- TalkBack Technology hardware
- TalkBack Technology monitoring software allows the system administrator to see a list of all TalkBack clocks in the system, their location, and their status
- TalkBack transmitter and receiver
- The TalkBack Master Clock can be set to notify the system administrator via email alert:
  - When a TalkBack clock is missing or a status report has not been received
  - A hand failure of an analog clock
  - A display failure of a digital clock
  - When a clock battery is low (for battery operated clocks)

SMA 5000 Series Optional Feature:

- GPS input for accurate time synchronization
- NTP server upgrade

SMA 6000 Series Features

The SMA 6000 Series Master Clock includes all of the standard features listed with the SMA 3000 series as well as the following:

- TalkBack Technology hardware
- TalkBack Technology monitoring software that allows the system administrator to see a list of all TalkBack clocks in the system, their location, as well as monitoring their status
- TalkBack transmitter and receiver
- The TalkBack Master Clock can be set to notify the system administrator via email alert:
  - When a TalkBack clock is missing or a status report has not been received
  - A hand failure of an analog clock
  - A display failure of a digital clock
  - When a clock battery is low (for battery operated clocks)

SMA 6000 Series Optional Features:

- Four or eight configurable auxiliary relays
  - 255 schedule (group of events) and 800 event capabilities (such as triggering bells)
  - Two programmable closure durations per relay
- Pre-scheduled countdown feature – The master clock will send a countdown command to all digital clocks at a predetermined time. When choosing this option, at least four zone relays are required.
- GPS input for accurate time synchronization
- NTP server upgrade

NTP 7000 Series

The NTP 7000 Series includes all the standard features listed with the SMA 2000 Series, as well as the capability of acting as an NTP server and provide NTP time to other IP devices in the facility.

SMA 7000 Series Optional Features

- GPS input for accurate time synchronization
- Transmitter for the Wireless System

NTP 8000 Series

The NTP 8000 Series includes all the standard features listed with the SMA 3000 Series, as well as the capability of acting as an NTP server and provide NTP time to other IP devices in the facility.

SMA 8000 Series Optional Features

- Four or eight configurable auxiliary relays
  - 255 schedule (group of events) capability and 800 event capability
  - Two programmable closure durations per relay
- Pre-scheduled countdown feature – The master clock will send a countdown command to all digital clocks at a predetermined time (Four or eight zone relays are required)
- GPS input for accurate time synchronization
- Transmitter for the Wireless System

The IP devices in the facility are referring to the NTP - Master Clock via LAN in order to receive NTP time.

THE ADVANTAGE

Fully Functional Web Interface

Our web interface allows the system administrator to have total control of the master clock's settings through an easy-to-use built-in web interface. This will allow the system administrator to control settings such as Daylight Saving Time, E-mail-alerts, NTP server settings, and so much more from any computer on the same network.

Automatic Daylight Saving Time Update

Depending on the size of a facility, it would be a difficult and time consuming task to adjust each clock when Daylight Saving Time occurs.

With a master clock controlling the system, there is no need to worry about adjusting the time on each clock by hand, as the clocks will automatically update themselves. This feature not only saves time, but also saves money in maintenance fees over the life of the system.

NTP Server Redundancy

To ensure complete accuracy within a system, master clocks allow a user to input up to 10 NTP server IP addresses for redundancy purposes. If communication with one NTP server is lost, our master clock will automatically move to the next NTP server IP address that is on the list.

E-mail Alerts

A user is able to receive automatic e-mail alerts when specific changes have been made to the master clock or if communication with the accurate time source has been lost. This feature allows a user to always be aware of the status of the master clock.

Interfacing with Other Systems

We want to make integrating our clock system within a facility as simple as possible. Our master clock is capable of interfacing and receiving various time protocols such as 58 minute correction, 59 minute correction, National Time / Rauland correction, or Dukane protocol.

System Flexibility

A master clock equipped with a transmitter can provide time to both wired clocks, as well as to wireless clocks in the system. This allows users to replace old clocks with new clocks in stages. In this case, while the master clock is providing the wired clocks with the time signal in a wired manner, it is also transmitting the time signal wirelessly. Our Synchronized Clock System also provides the flexibility to mix between analog and digital clocks offered in different shapes and sizes.

Simplex TIME SOLUTIONS

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